

WHAT IS CLAIMED IS:

1. An isolated DNA molecule encoding at least two different inward rectifier, G-protein activated, mammalian, potassium Kir3.0 polypeptides, wherein said nucleic acid is characterized by its ability to cause a change in potassium flow across a *Xenopus* oocyte cell membrane upon expression therein.

2. A nucleic acid according to Claim 1, wherein said mammalian Kir3.0 polypeptides are Kir3.1/KGA and Kir3.2.

3. A nucleic acid according to Claim 1, wherein said mammalian Kir3.0 polypeptides are Kir3.1/KGA and Kir3.3.

4. A nucleic acid according to Claim 1, wherein said mammalian Kir3.0 polypeptides are Kir3.2 and Kir3.3.

5. A nucleic acid according to Claim 2, wherein said Kir3.1/KGA polypeptide has the amino acid sequence of SEQ ID NO:2.

6. A method of producing a functional Kir3.0 channel in an expression host cell, the method comprising:

introducing into said expression host cell a nucleic acid encoding a first mammalian Kir3.0 polypeptide and a nucleic acid encoding a second mammalian Kir3.0 polypeptide into said heterologous cell under conditions that permit expression of said nucleic acids;

wherein said mammalian Kir3.0 polypeptides assemble to form a functional Kir3.0 in said expression host cell.

7. A method according to Claim 6, wherein said nucleic acid encoding said first mammalian Kir3.0 polypeptide and said nucleic acid encoding said second mammalian Kir3.0 polypeptide are present on a single vector.

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8. A method according to Claim 6, wherein said nucleic acid encoding said first mammalian Kir3.0 polypeptide and said nucleic acid encoding said second mammalian Kir3.0 polypeptide are present on different vectors.

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9. A method according to Claim 6, wherein said mammalian Kir3.0 polypeptides are Kir3.1/KGA and Kir3.2.

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10. A method according to Claim 6, wherein said mammalian Kir3.0 polypeptides are Kir3.1/KGA and Kir3.3.

11. A method according to Claim 6, wherein said mammalian Kir3.0 polypeptides are Kir3.2 and Kir3.3.

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12. A host cell comprising a functional heterologous Kir3.0 channel; wherein said functional Kir3.0 channel comprises a first Kir3.0 polypeptide and a second mammalian Kir3.0 polypeptide assembled to form a functional Kir3.0 channel.

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13. A host cell according to Claim 12, wherein said mammalian Kir3.0 polypeptides are Kir3.1/KGA and Kir3.2.

14. A host cell according to Claim 12, wherein said mammalian Kir3.0 polypeptides are Kir3.1/KGA and Kir3.3.

15. A host cell according to Claim 12, wherein said mammalian  
5 Kir3.0 polypeptides are Kir3.2 and Kir3.3.

16. A host cell according to Claim 12, wherein said host cell is a *Xenopus laevis* oocyte.

10 17. A method of screening for agents that modulate the activity of a Kir3.0 channel, the method comprising:

combining a candidate agent with a functional Kir3.0 channel under conditions that permit inward  $K^+$  current

determining the induced current;

15 wherein a change in said induced current in the presence of said agent as compared to a control is indicative that said agent modulates the activity of a Kir3.0 channel.

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